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Abstract

Over the last few years, organizations have increasingly been paying attention to the concept of enterprise content management (ECM), which refers to the strategies, methods, and technologies required for capturing, storing, retrieving, delivering, and retaining all types of digital information across the organization. While the market for ECM software is rapidly growing, information systems (IS) research has not paid much attention to the topic. At the same time, the boundaries between the emergent concept of ECM and the rather well-established management approach of business process management (BPM) are becoming increasingly blurred in practice. From an academic point of view, however, the role that content plays in the management of business processes, and vice versa, remains largely unexplored. In order to prepare the ground for IS researchers to theorize about the relationships between the two concepts this paper identifies contemporary challenges that drive ECM implementation from a process point of view. The findings are grounded in the analysis of qualitative data from two case studies and are categorized based on a content lifecycle model.

Keywords: Business process management, Case study research, Content management, Document management, Drivers, Enterprise content management.

Authors are listed alphabetically to denote equal contribution.

1 Introduction

ECM can be considered an integrated approach to information management (Päivärinta and Munkvold 2005, pp. 8-9) that covers and aligns related concepts such as document management, (Web) content management, and records management at an enterprise-wide scale (vom Brocke et al. 2010, p. 2). ECM further relates to a variety of research fields that are at the core of the IS discipline, including knowledge management and information resource management (Munkvold et al. 2006, pp. 86-93). As such, the concept of ECM includes "the strategies, tools, processes and skills an organization needs to manage all its information assets (regardless of type) over their lifecycle" (Smith and McKeen 2003, p. 648). Given the ever-expanding digital information flood that is increasingly challenging industry, it is not surprising that ECM has evolved into an important topic for information and knowledge workers from various branches of trade (Päivärinta and Munkvold 2005, p. 1). Because ECM relates to both technological and managerial challenges (Munkvold et al. 2006, pp. 75-77) it also constitutes a relevant IS research topic (Tyrväinen et al. 2006, p. 628).

Notwithstanding the practical relevance of the concept, IS researchers have rarely endeavored to develop theories that explain the impacts of ECM on individuals, groups, and organizations. Instead, most IS studies on ECM are design-oriented in nature, thus proposing methods, standards, and tools for ECM implementation (Tyrväinen et al. 2006, p. 632). Päivärinta and Munkvold (2005) put this problem as follows: "Unless we would assume that ECM brings up only positive consequences, there remains […] a challenge to complement the success stories with in-depth studies on all possible impacts, including negative ones" (p. 3). Except few examples (e.g., Nordheim and Päivärinta 2006; Scott et al. 2004), IS researchers have not reported many empirical studies on strategic and enterprise-wide content management initiatives (Munkvold et al. 2006, p. 71). Industrial case narratives, in turn, frequently represent rather short and, by their very nature, less replicable essays authored by ECM vendors. In such essays it has, for example, been estimated that ECM can lead to better internal and external collaboration, value-added or new customer services and products, improved reliability and quality of content, more meaningful knowledge work, an improved organizational memory, direct cost savings, better fulfillment of external regulations and standards, as well as more efficient, effective, and flexible business processes (Päivärinta and Munkvold 2005, pp. 2-3). Given this treatment of ECM as a solution for nearly all contemporary information management problems, the understanding is still vague as to what organizations strive to gain through implementing ECM systems and what results they can expect from the same. While prior work has mainly discussed the issues that evolve around the implementation and customization of ECM systems (Munkvold et al. 2006), the challenges that drive such endeavors still remain rather elusive. The present paper, which is grounded in the data of two case studies, addresses this research gap with the following research question:

What are the drivers behind ECM initiatives?

In order to seek answers to the above research question the paper adopts a process-oriented perspective of ECM (vom Brocke et al. 2011). Its objective is to categorize ECM drivers on the basis of a content lifecycle model that is grounded in the academic literature. These lifecycle phases are at the interface between the two concepts of ECM and BPM because they describe content-related activities that business processes frequently rely on, for example, regarding the creation and processing of content. In line with prior empirical studies on ECM, former theory on the content lifecycle thus served as an initial guide to the collection and analysis of the data from the two case studies (Munkvold et al. 2006, p. 74).

The paper proceeds as follows. Section 2 explains the study's research background and introduces the concept of ECM. Section 3 provides an overview of the research process. Section 4 presents the challenges that drove the ECM initiatives in the two case organizations. After discussing its implications (section 5), the paper concludes with a summary and acknowledges limitations (section 6).

2 Research background

There is still much confusion around both the subject and scope of the nascent concept of ECM (Smith and McKeen 2003, p. 648). As a result, some authors even do "not attempt to tackle ECM" at all (Clark 2008, p. 40). According to Blair (2004, p. 65), the notion of ECM has been introduced with the turn of the millennium by *AIIM (Association for Information and Image Management) International*, a professional forum for information and knowledge managers (http://www.aiim.org/). On the basis of both Smith and McKeen's (2003, p. 648) early definition of ECM introduced above ("the strategies, tools, processes and skills an organization needs to manage all its information assets (regardless of type) over their lifecycle") and existing research in the IS domain, ECM can be characterized as an approach that integrates a variety of related concepts, for example, document or content management, at an enterprise-wide scale:

Integration of all types of information. ECM is about managing the entirety of an organization's information ("all its information assets"). The focus of ECM in particular lies on semi- or unstructured information (Blair 2004, p. 65), as it is, for example, also the belief of John F. Mancini, President of *AIIM* (Sinnett 2006, p. 61). Some IS researchers, however, also consider structured data part of an ECM strategy (e.g., Munkvold et al. 2006, p. 70; Nordheim and Päivärinta 2006, p. 649). In the context of ECM, the notion of content refers to both complete information products (e.g., Web pages and documents) and single content components (e.g., text modules, graphics, or images) (Clark 2008, p. 45). As a function of granularity, such content components can range from entire text passages to separate sentences (Rockley et al. 2003, p. 24); this is perhaps why O'Callaghan and Smits (2005, pp. 1271-1274) consider ECM the synopsis of both document management and content management. In this paper, all possible forms of digital information assets – regardless of their granularity level – are subsumed under the concept of content. Examples include (the content embedded in) Web pages, records, budget documents, marketing materials, e-mails, reports, photographs, and drawings (but also new media such as audio and video).

Integration of technological and managerial issues. The concept of ECM represents a phenomenon that is both managerial and technological in nature („strategies, tools, processes and skills"), which O'Callaghan and Smits (2005) put as follows: "The problem really has two facets: business issues, and technology issues" (p. 1271). ECM thus exceeds the many definitions available in practice that tend to focus on software products and technologies only (Tyrväinen et al. 2006, p. 628). *AIIM*, for example, solely referred to technologies in their ECM definition until 2004 (Wikipedia 2010). In IS research, however, most authors also include managerial issues into their conceptualizations of ECM (e.g., strategies or methods, as in the current *AIIM* definition; Ibid). In their review of prior IS research on ECM, vom Brocke et al. (2010), for example, differ between four distinct dimensions of ECM: tools, strategies, processes, and people. Tyrväinen et al. (2006, p. 628) likewise distinguish four core perspectives that IS researchers can take when exploring the concept of ECM: content, processes, technologies, and the enterprise context.

Integration of the content lifecycle. ECM is about managing content over the entire lifecycle ("over their lifecycle"), reaching from content creation to deletion. ECM can hence be distinguished from related concepts that typically focus on individual lifecycle phases. Examples of such concepts include document management (storing and retrieving content), Web content management (publishing content), or records management (retaining content) (vom Brocke et al. 2010, p. 1). ECM, in contrast, suggests a holistic view on the content lifecycle (Smith and McKeen 2003, pp. 651-654), which is also reflected by prior IS research. Munkvold et al. (2006), for example, in their longitudinal study of an ECM initiative at a Norwegian oil company, state: "The *Statoil* data confirms the importance of a *holistic focus* on content life cycle, from capture/creation to long-term retention or deletion, as a *core characteristic* of ECM" (p. 85; emphasis added). Against this background, the content lifecycle is at the core of the present study.

3 Study overview

This paper is part of a larger research endeavor that develops theory about the management of business processes that are highly dependent on content. Data is collected from five ECM-adopting organizations that operate in different businesses and industries. The study in particular focuses on the impact that ECM software packages can have on an organization's business processes and their management. The applied research strategy is that of interpretive case studies. Case studies examine "a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities" (Benbasat et al. 1987, p. 370). There are different approaches to case study research (e.g., Eisenhardt 1989; Klein and Myers 1999; Oates 2006; Yin 2003). Interpretive case study research is an appropriate strategy of inquiry for this research because the phenomenon under investigation, namely ECM and the adoption thereof, is of high practical relevance and cannot be separated from the organizational context in which it is carried out (Benbasat et al. 1987). Moreover, ECM is an emergent topic characterized by the absence of a broad theoretical base. As such, an intimate connection to the data is desired and the phenomenon of interest should be studied in its natural setting. Considering the exploratory nature of this research, it is also not necessary to control any subjects or events (compare Benbasat et al. 1987, p. 372).

The purpose of the present paper is to present and discuss the challenges that drove the ECM initiatives in two of the studied case organizations. The first organization is an automotive supplier company that provides steering systems for carmakers. With over 4,000 employees in 16 locations worldwide, it generates a turnover of close to 1,000 Mio € The second organization is an innovative dental enterprise, with a comprehensive product portfolio for dentists and dental technicians. It has a global presence with 22 local subsidiaries and branch offices and supplies its products to more than 120 countries around the world. It employs more than 2,300 people, altogether generating a turnover of approximately 400 Mio € Data sources in both organizations included interviews, corporate documents, presentations, minutes, and workshops with ECM project team members. A total of twelve persons were interviewed (six per organization), with an average interview length of around 60 minutes. The interviewees, selected by the two ECM project coordinators, filled key roles related to information management in different business units at the two case organizations. Data collection took place from December 2009 to May 2010; all interviews were audio-taped and fully transcribed. The transcripts were sent back to the informants in order to improve the validity of the results. The interviews were semi-structured and focused on the following areas: (1) current content management practices and systems, (2) perceived challenges and expected benefits, and (3) suggestions for improvement. Throughout these three parts, the interviews were organized on the basis of a content lifecycle model, which is described in the following section. This is in line with prior studies on ECM that used the content lifecycle as an initial guide to the collection of data (e.g., Munkvold et al. 2006, p. 74). The software tool *NVivo* was used in order to analyze and code the data, where the content lifecycle again informed the research in that it sensitized the researchers for what is important in the data (Klein and Myers 1999).

4 ECM drivers

4.1 Overview

In IS research, a multitude of content lifecycle models exist. Päivärinta and Munkvold (2005) provide a very detailed picture of the activities within the content lifecycle, including capturing, creating, reviewing, editing, distributing, publishing, storing, archiving, and deleting enterprise content (p. 4). McNay (2002) more generally differentiates between creating, approving, delivering, and managing content (pp. 398-399), while Smith and McKeen (2003) highlight the importance of capturing, organizing, processing, and maintaining content (pp. 651-654). Grounded in these and related works, this paper distinguishes the following lifecycle phases: creating, capturing, editing, reviewing, storing, retrieving, retaining, and deleting content. While this model is by no means exhaustive, it exhibits a lev-

el of generality that can accommodate a broad range of further lifecycle phases that other researchers consider potentially relevant (e.g., content distribution and approval as proposed by Päivärinta and Munkvold 2005, for example).

As indicated, this paper provides a process-centric perspective on ECM: The above lifecycle phases describe activities that are typically part of business processes (vom Brocke et al. 2011). Whenever content is handled within a business process (i.e., it serves as an input for, is transformed by, or is the output of an activity or a set of activities), one or more of the lifecycle phases are involved. As such, they are at the interface between the two concepts of ECM and BPM (vom Brocke et al. 2011). The different phases ultimately "change the content and affect not only how it is used in the organisation, but also possibly the way organisations are able to operate" (Iverson and Burkart 2007, p. 411). The adoption of ECM thus directly impacts an organization's business processes, because employees are required to get used to new ways of creating and processing content (Pullman and Gu 2008, p. 2). In line with this, ECM systems make extensive use of workflow components, and BPM solutions, in turn, often build upon ECM-related functionality (Allen 2007, p. 35). As a consequence, it has been argued that the boundaries between BPM and ECM are becoming increasingly blurred in practice (Chambers 2007, p. 36). Against this background, the above described content lifecycle model is used in the following for describing the challenges that drove the ECM initiatives in the two case organizations. In doing so, the informants' viewpoints and experiences are combined with the academic literature on this matter in order to create an overview that is grounded in both prior IS research and current business practice.

4.2 Creating and capturing content

Contemporary organizations are typically facing several challenges regarding content creation. First, they increasingly experience the problem of recreating already existing content. Rockley et al. (2003) believe that some organizations spend "a lot of time, money, and resources essentially creating, recreating, and re-creating the same content" (p. 7). This was also indicated by several of the interviewees (quotes are translated from German to English by the authors), for example:

> *I trust this happens too often [recreating existing content]. This is, however, a more general problem that not only occurs at our company.*

Respondents also mentioned potentially dangerous consequences of recreating existing content, including a loss of both efficiency and information quality. As to the former, employees not only waste their time in the course of rewriting content that already exists. Oftentimes, content is also recreated after an unsuccessful and time-consuming content search:

> *Avoiding the recreation of existing content is a timely challenge, in particular when it comes to the execution of new processes […]. Where to search for information that you don't know about?*

As to the latter, Lee et al. (2002, pp. 134-136) remind us that information quality can be measured in different ways, including, for example, the accuracy, completeness, essentialness, clarity, or precision of information. Three measures in particular appear relevant regarding the creation of content: the timeliness, consistency, and correctness (vom Brocke et al. 2010, p. 1). Regarding the timeliness of content one respondent made the following statement:

> *The digital information flood is increasing in such a way that everyone knows: Something that was new yesterday can be outdated today.*

As to the consistency of content, duplicating existing content multiple times can result in different versions that are very likely to be inconsistent with one another – a problem that many companies experience today, as the following statement exemplifies:

> *Inconsistencies among documents today exist in all companies – one can say what he wants.*

Inconsistent content, however, not only results from recreating prior information, but also from inappropriately reusing content, as the majority of documents are typically not created from scratch, but rather generated from the retrieval and reuse of existing content. Employees often do so by copying

content from existing documents, pasting it into new ones, and finally editing it therein (Rockley et al. 2003, p. 24). Such a manual copy-and-paste approach to creating content, however, can result in inconsistencies that not only matter in economic, but also in legal terms as content often includes legally binding information:

> *All the documents we publish [in the Marketing department] – for example, in the Internet, in an operating manual, or in a brochure – contain so-called 'guaranteed product characteristics'. If these documents are corrupted this might also draw legal consequences.*

The inappropriate reuse of content may also cause a mismatch with the context in which the content is used. This can not only impact the clarity or appropriateness of the created document, but also its ultimate correctness. One respondent said:

> *[…] documents are frequently created via copy-and-paste. This, however, bears a high risk, for example, when a document becomes legally relevant: The document might appear consistent and correct […] there's only this one little mistake resulting from a copy-and-paste error. Such cases are, of course, very unlikely – but they could indeed happen and would cost us a lot of money.*

Obviously, in order to avoid the recreation of content, organizations must empower their employees to access existing content. By implication, content that is not captured can hardly be found. The implementation of ECM systems thus often represents a massive attempt to collect and digitize content (Smith and McKeen 2003, p. 651). During the case studies it became apparent that, at the most basic level, content can be characterized on the basis of both its origin (internal and external) and its format (digital and paper). The relevance of both characteristics becomes apparent in the following statement:

> *Mostly, we maintain correspondence with our suppliers and customers […] electronically. Of course, however, we also exchange paper documents.*

In general, it is much easier to capture internally created content as compared to externally created content. This is because internal content often follows predefined templates and, hence, it is likely that much of the required metadata can be collected automatically. Moreover, metadata can directly be specified by the content producers. A further distinction must be made, however, as to whether content exists in a digital format or not. Both of the studied organizations, for instance, are characterized by a high level of innovation, where it is the rule rather than the exception that employees create paper documents. Examples include freehand sketches, hand written protocols, or meeting notes. Capturing (i.e., scanning) paper files thus marks an important task in today's information management. Such documents frequently cover information of high strategic relevance (e.g., creative ideas, designs, or preliminary solutions):

> *We do not just work with our CAD system [computer aided design] in order to develop new designs. Very often, we rather meet personally and brainstorm together. In such meetings we create, for example, freehand sketches that are scanned afterwards and finally get organized in folders.*

Because such documents carry an enormous innovative potential, it is essential for organizations to develop and implement an effective way to systematically capture them. The case study data suggests, however, that typically these documents do not follow any predefined structures, which is why the reduction of paper-based processes marks another important information management challenge for today's organizations:

> *The question is what types of paper documents we need in the end. Couldn't we just transfer them into a digital format and an integrated file system?*

The above challenge becomes even more paramount with respect to external content that organizations are supplied with in paper format. Examples include incoming paper invoices, hardcopy contracts, faxes, and letters. Such content must be properly organized so that it can be easily retrieved later on (e.g., for reconstructing prior business transactions and cases):

> *We are currently implementing a new […] database in which contracts and all relevant correspondence can be filed electronically in order to enable quick and comprehensive overviews.*

In conclusion, five ECM drivers related to the creation and capturing of content were identified in the two case studies. While three of them tend to emerge during the creation of content (recreation of ex-

isting content, inappropriate reuse of content, and poor information quality), two mainly concern the capturing of content (reducing paper-based processes and capturing externally created content).

4.3   Editing and reviewing content

There are several reasons for editing content, including updating content that is obsolete, repurposing content for different audiences and contexts, or simply revising content in terms of language or orthography. The challenges that evolve around content editing are determined by the particular type of content. Content types differ, for example, with regard to the frequency of change:

> *In the first instance, the change frequency is subject to the specific type of document. While some documents are created once and then largely remain unaltered, others are corrected and changed at a very high frequency rate. Presentations, for example, are frequently customized to meet specific customer needs and may possibly get translated into other languages.*

During the case studies it further became apparent that the urgency of editing content is, among others, largely influenced by both the reasons for revising the content and its intended audience. If content in a customer document (e.g., a product manual), for example, proves corrupted, the urgency of updating it is probably higher as compared to an internal document. Editing such content, however, frequently is both inefficient and cost-intensive for organizations:

> *It is very time-consuming and cost-intensive to implement such revisions. Imagine a user manual... the main question here is: Do we have to change, reprint, and destroy the outdated version right away? Or later when it gets reprinted anyway?*

Things become even more difficult when content is embedded in different documents: Product descriptions, for instance, are usually contained in various information products, including instruction manuals, sales presentations and catalogues, or marketing flyers and brochures. It is in the early stages of the product lifecycle in particular, when such documents are subject to change. Obviously, implementing required changes in all relevant materials is critical:

> *Have these changes been considered for all product labels and packages? In every single product manual? In all the advertising materials?*

Updating external content marks another challenge. As indicated, companies heavily rely on externally created documents, including safety regulations, customer requirements, and legal norms. Such documents are often changed at an irregular but high frequency, and organizations need to keep up-to-date with such standards (that frequently also contain legally binding information). Not in all cases, however, they are provided with the relevant updates; it is very likely that they must actively retrieve the required information about modifications:

> *The problem with Material Safety Data Sheets is that our vendors do not necessarily inform us about updates. They rather share them online so that we have to check them ourselves.*

In order to face the above described challenges, content is reviewed on a regular basis. This, however, proves difficult in particular when different people are involved in the review process. One of the interviewees, for example, mentioned the risk of overlooking corrections during a collaborative reviewing procedure:

> *Regarding a brochure, for example, there is a certain risk that reviewers do not check the complete document again but only single passages... corrections in other parts may then get lost...*

The data further suggest that a lack of awareness of the importance of regularly reviewing content may lead to inefficiencies. In particular, releasing content too early can result in unnecessary and time-consuming review cycles. The following statement exemplifies this:

> *I also feel that some of our employees do not take the review and approval process too seriously at the moment [...]. Of course, we also had to change our documents in the past, but mostly because of product revisions and new findings. In contrast, change requests today frequently occur right after document approval...*

Reviewing processes, however, are not only necessary when content is edited. Organizations must also be aware that some content assets have an expiry date. Examples include images (that companies are, due to licensing issues, only allowed to use for a certain time period) or internal and external patents and contracts.

Our contracts are mainly long-term, which is why they sometimes have to be updated even during their run time, for example regarding prices or quantities... the resulting effort can be significant...

In conclusion, the study revealed six ECM drivers related to editing and reviewing content. While three of them mainly concern content editing (inefficient revising of content; incomplete updating of content that is embedded in different outlets; keeping up to date with external content), another three relate to the reviewing process (lost corrections in collaborative reviewing endeavors; poor reliability of content approvals; monitoring and updating fixed-term content).

4.4 Storing and retrieving content

Content storage and retrieval processes are at the core of any ECM strategy. Smith and McKeen (2003) put this as follows: "content is useless if it cannot be easily searched or navigated" (p. 652). The first step in making content searchable is to implement a corporate taxonomy, which categorizes content hierarchically and "defines the identities of information and record sources" (Bridges 2007, p. 39). The development of a corporate taxonomy represents an important standardization challenge for organizations, because the file systems they use are typically organized differently in their various departments:

Regarding content that is not project-related [...] our departments have implemented somehow isolated applications and different storing solutions in the past...

The case study data suggests, however, that a corporate taxonomy should not only provide employees with standardized guidelines that enable efficient information sharing among different departments, but also with sufficient freedom to store content in a way that best fulfills their individual and departmental requirements:

I think this is a balancing act... I consider it counterproductive to take all the freedom from the people. Corporate guidelines are important nevertheless...

Another important aspect of storing content is that of version control. Rockley et al. (2003) write that "software management tools can automate version control, but otherwise, it must be manually enforced" (p. 84). In such cases, organizations must safeguard sufficient expertise and awareness at the level of the individual employee. Failure in this regard can cause the distribution of outdated or incorrect content as the following example highlights:

Just recently, a colleague wasn't in the office and I therefore had to answer her inquires. Later she informed me that I had forwarded an outdated document version...

Another challenge regarding the storage of content is that of avoiding redundancies in filing. In one of the studied organizations, for example, pictures and reports of the same version were stored in different project folders. Storing multiple copies of the same content can not only result in higher storage costs but also in inconsistent content. One respondent said:

How can one make sure that documents are not stored redundantly?

Data safety is another content management issue for today's companies which obviously do not want their content to get lost. Content therefore must be stored on shared and secure drives. In the first instance, disaster recovery enables avoiding content loss (e.g., damages by fire or water); sometimes, however, employees also store content locally on personal hard drives (or other types of external media). In case the employee leaves the company, so does the content – and thus his or her knowledge:

Technically, our product managers can store their documents locally... if they, however, do so and leave the company, a huge part of their knowledge leaves us as well...

Storing content enables the later retrieval. In this context, it is particularly important for organizations to protect their content against unauthorized access (since it often carries knowledge of competitive advantage). Chiu and Hung (2005) mention potentially dangerous consequences of a poorly designed content access, including unauthorized disclosure, modification and destruction of information as well as unauthorized utilization and misuse of resources (p. 3). For companies that particularly rely on their innovation processes, access control is of outmost importance for protecting content against theft and espionage:

> *[…] espionage is an important topic... especially for us, as the market leader […]. I've heard of several companies [... whose] products have been plagiarized in the nearer past...*

Chiu and Hung (2005) understand access control "as the mechanism by which users are permitted access to resources according to the authentication of their identities and the associated privileges authorization" (p. 1). At an enterprise-wide scale it is, however, not easy to determine appropriate privileges for accessing content. Obviously, the security level increases with higher levels of access restrictions. High security levels, however, can in turn also prevent employees from efficiently accessing and using the content they need in their daily work:

> *As to the editing of content, I basically support very strict access regulations. In contrast, I think reading content should be possible for more employees. Needless to say, I do not speak of confidential documents here, for example, contracts...*

The efficiency of content access is largely determined by the search mechanisms that employees can use for retrieving content. There are several approaches to searching for content, including tables of contents, indexes, and full-text searches (O'Callaghan and Smits 2005, p. 1272). During the case studies it became apparent that search practices widely differ at an inter- and intra-organizational level. Often, searching content is perceived as being inefficient:

> *We have different databases in our company that I already searched without success... some of the search fields these databases offer are certainly not ideal.*

Selecting and implementing appropriate sets of search mechanisms thus marks an important challenge for information managers. It must be distinguished as to whether employees are aware of existing content or not when they search for it; typically, a content search proves more time-consuming in the latter case. If an employee is not able to find content it is further possible that he or she forwards a content request to a colleague who either knows where to find the required information or possesses the privileges for accessing it:

> *When I need a document I often simply ask a colleague for it.*

However, such a manual – often e-mail-based – approach to content exchange comes along with the risk of processing outdated information. Imagine, for instance, the same employee would require the same document at a later time again. Then he or she would perhaps not ask for it again, but rather build on the version that was forwarded in the first place. Since the document might have been updated in the meantime, it turns out that creating awareness among content users for content exchange is another challenge in current information management practice. A respondent said:

> *Today, much content exchange is through e-mail...*

In conclusion, seven ECM drivers were identified regarding content storage and retrieval, namely lack of a corporate taxonomy, poor version control, redundant storage of content, and content and knowledge losses (storing content), as well as inefficient and ineffective content access, insufficient search mechanisms, and inappropriate content exchange (retrieving content) .

4.5   Retaining and deleting content

One of the ECM drivers most frequently mentioned in the literature is compliance (Andersen 2008, p. 65). Legal obligations and standards that are relevant for content management in particular concern the retention of content. Content retention requirements, which can also originate from both customers' and internal demands, cause challenges that concern internationally operating companies in par-

ticular, as these have to consider the legal obligations of different countries. A respondent mentioned the example of product development documentations:

> *Product development documentation, for example, not only has to be retained as long as the product is distributed on the market, but also for a couple of years after the product has been withdrawn from sale. The retention period, however, widely differs between countries.*

According to the German revenue code, for instance, certain types of content must further not be changed or manipulated retroactively and have to be both relatable to prior business transactions or projects and quickly available if required (§§ 146 & 147). Obviously, meeting all required standards marks a challenge in retaining content. Munkvold et al. (2006) write in their study of the *Statoil* case: "Statoil also needs to carefully comply to a number of external regulations and guidelines for document storage and archival. […] In a largely distributed enterprise, these challenges are far from trivial" (p. 80). These and related issues also became apparent during the case studies, for example:

> *Clear and structured archiving is especially important regarding law cases... we have to safeguard that such documents are filed appropriately [in order to enable a quick retrieval later on].*

A further distinction can be made as to whether content exists in a digital format or not. Frequently, companies are uncertain whether to retain content in an electronic or paper form (i.e., whether or not they are allowed to destroy certain paper files). Retaining documents in both formats, however, can lead to redundant, and thus inefficient, archives:

> *Which documents do we have to print and file in paper form? It is a double effort to retain documents both electronically and paper-based...*

It thus appears challenging for organizations to efficiently archive both electronic and paper files. This, in turn, requires the alignment of the digital and physical archives among different departments:

> *Some departments use their electronic file structures for organizing their paper documents, while others retain their paper documents very differently...*

Once the retention period of content has expired, it can be deleted by law. As indicated, the reduction of paper represents a common ECM driver, for example, in order to give room for storage (vom Brocke et al. 2011). Deleting electronic documents, however, comes with its own challenges. The ongoing digitization of content – together with the decreasing storage costs – can mislead companies into storing content until doomsday:

> *I have heard of companies that don't any longer delete information at all.*

Data protection acts, however, forbid the storage of content for an unlimited period (e.g., regarding content that covers personnel or customer data). The development of an efficient strategy for deleting content thus marks a last challenge the data suggest:

> *The collection of content involves a great deal of expense. On the other hand – and this should not be underestimated – there are certain records that we have to destroy at some point in time.*

In summary, two ECM drivers regarding content retention were identified: ensuring compliance (e.g., retention time, format, and access) and efficiently organizing both paper and electronic archives. Finally, companies must also develop an appropriate strategy for deleting content.

5 Implications

The two case studies allowed the researchers to identify several contemporary ECM drivers, reaching from the recreation of existing content to an inappropriate deletion of content. It is hoped that the paper makes a useful contribution to both research and practice.

As explained in the Introduction, ECM is a very immature research topic. In particular, the understanding is still vague as to what organizations strive to gain through implementing ECM systems and what results they can expect from the same. Nordheim and Päivärinta (2005), for example, analyzed a variety of ECM case narratives and identified several objectives presented within these papers. These objectives, however, often remain rather broad and thus difficult to pursue for organizations. In con-

trast, the ECM drivers presented in this paper are less general and can thus better assist IS researchers in further theorizing about ECM adoption. As such, the paper complements related works on the challenges of ECM, most notably the *Statoil* case study by Munkvold et al. (2006). It is, for example, often argued that the implementation of ECM systems can improve information quality. This paper, however, confirms that it is mainly the consistency and timeliness of information that can be enhanced (e.g., vom Brocke et al. 2010). In line with Andersen (2008), who explains how the quality of content can suffer from the automated reuse of content enabled by modern ECM systems (pp. 75-76), the results also indicate a number pitfalls related to the management of content, for example, the creation of content that is less appropriate, correct, and understandable. Grounded in a content lifecycle model, the paper has further adopted a process perspective on ECM. It is thus hoped that it can also make a useful step toward bridging the gap between the two concepts of ECM and BPM (vom Brocke et al. 2011).

In the practice of ECM, there is also a significant confusion around the meaning and boundaries of the concept. It is only recently that Hooper (2009) forcefully called for an ECM definition in *Infonomics*, a journal published by *AIIM International*. In fact, one of the main challenges related to implementing ECM largely remained unexposed in this research: given the many ECM-related concepts available in both research and practice, companies increasingly feel confused about which terminology to use. This paper can mitigate this challenge by informing organizations why to engage in ECM and what results they can expect from it. Practitioners can thus use the results for planning, executing, and evaluating their own ECM initiatives.

6 Conclusion

On the basis of a content lifecycle model 21 contemporary ECM drivers were presented and discussed in this paper. As such, it contributes to an emerging field of IS research. The results were grounded in both data derived from two case studies and the academic literature on ECM. It is hoped that the results can support both IS researchers in further theorizing about the concept of ECM and IS practitioners in planning and executing their own ECM initiatives. There are some limitations to the presented findings. First, data was collected from only two ECM-adopting organizations. Consequently, the identified drivers will not necessarily apply to all business environments. In addition, the case organizations' understanding of ECM partly differed, which is mainly why the drivers that led to the ECM initiatives in both organizations also did to some extent. Differences regarding these drivers were, however, not indicated in this paper. Besides, it is very likely that some ECM drivers remained unexposed during the study. Because the considered lifecycle phases are logically interconnected, there are also possible overlaps in the presented categorization. Other researchers may thus have chosen a different classification scheme. The presentation of the ECM drivers was further grounded in the academic literature on ECM. Note that the analysis of these literatures is not considered to be exhaustive. Since this paper is part of a larger research endeavor, future research will address these shortcomings.

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